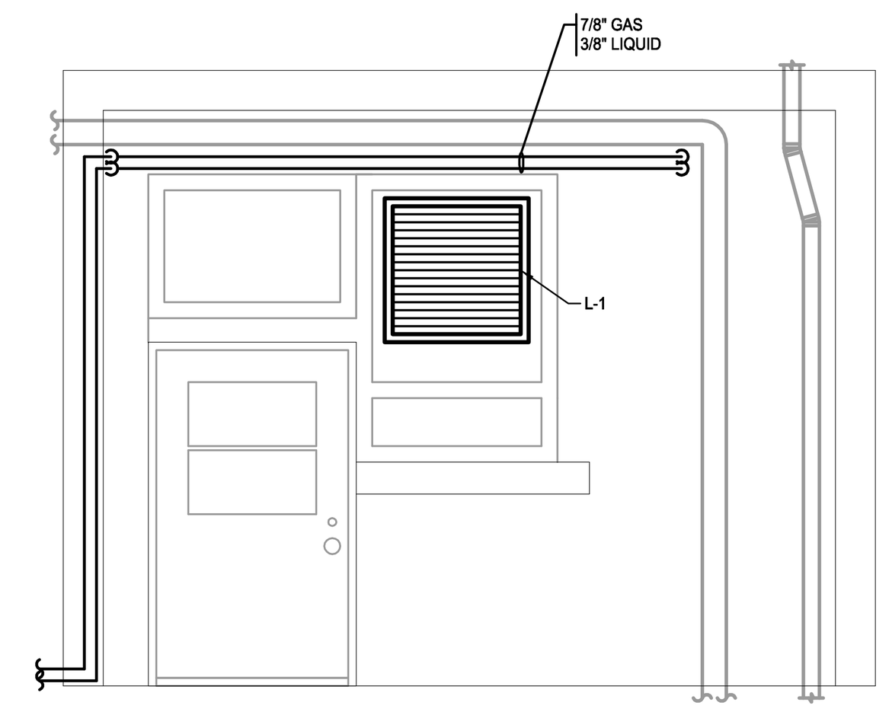
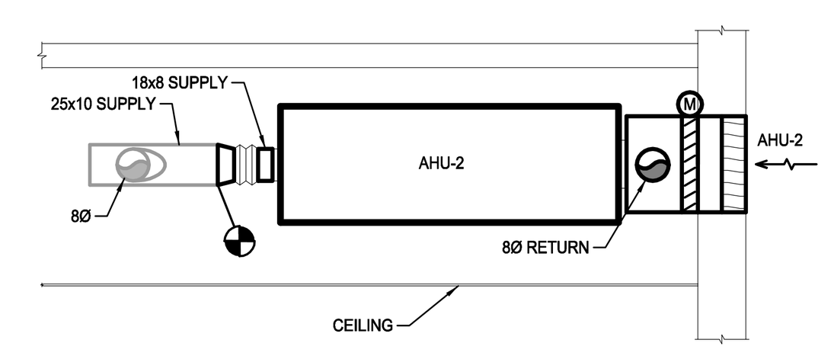


2 *MECHANICAL SECTION*
SCALE: 1/4=1'-0"



1 *MECHANICAL SECTION*
SCALE: 1/4=1'-0"

MECHANICAL PLAN NOTES

1. FILTER BOX SHALL BE A FLANDERS C-4 CRANK LOCK HEPA FILTER HOUSING OR EQUIVALENT WITH A VA GRADE A PRE-FILTER AND A HEPA VA GRADE E AFTER-FILTER.
2. CONTRACTOR SHALL MOUNT AIR HANDLER ABOVE CEILING.
3. CONTRACTOR SHALL MOUNT ACCU-1 AND ACCU-2 ON PAD IN FENCED AREA.
4. CONTRACTOR SHALL SUPPORT EXHAUST DUCTWORK FROM BUILDING WALL. DUCT SHALL BE PRE-FINISHED DUCT TO MATCH EXISTING COPING ON BUILDING. CONTRACTOR SHALL PROVIDE FULL COLOR RANGE SAMPLE WITH SUBMITTAL.
5. CONTRACTOR SHALL RE-ROUTE EXISTING CONDENSATE LINE.
6. SUPPORT DUCTWORK FROM BUILDING WALL AS REQUIRED.
7. EXHAUST DUCT THAT IS INACCESSIBLE SHALL BE LEAK TESTED. DUCT SHALL BE SEALED FROM INSIDE.
8. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER'S RECOMMENDATION REGARDING MODIFICATIONS REQUIRED TO AIR HANDLER TO RELOCATE FACE AND DAMPER BYPASS FROM TOP OF UNIT TO THE SIDE OF THE UNIT.
9. CONTRACTOR SHALL PATCH WALL OPENING TO MATCH BUILDING.
10. CONTRACTOR SHALL ROUTE PIPING THROUGH EXISTING COVER SHIELD MOUNTED TO THE EXTERIOR WALL.
11. CONTRACTOR SHALL PENETRATE WINDOW WITH SUPPLY DUCT. WINDOW OPENING SHALL BE SEALED WATER TIGHT.
12. CONTRACTOR SHALL PATCH HOLE AND MATCH TO EXISTING CONDITIONS.
13. RE-USED DIFFUSER.
14. CONTRACTOR SHALL ENLARGE WINDOW PANEL OPENING TO ACCOMMODATE LARGER DUCT AND SEAL WATER TIGHT.
15. CONTRACTOR SHALL WIDEN EXISTING WALL OPENING FOR NEW DUCT RUN.
16. CONTRACTOR SHALL ROUTE DUCT THROUGH BULK HEAD AS REQUIRED.
17. CONTRACTOR SHALL MAKE A SITE VISIT DURING BIDDING PHASE TO EVALUATE STEAM / CONDENSATE PIPING ACCESS.
18. TCP BOX CAN BE RE-USED FOR NEW TCP.
19. ROUTE COOLING CONDENSATE OUT THROUGH EXTERIOR WALL AND DOWN TO 24" ABOVE GRADE. PIPE SHALL BE TYPE K COPPER PIPE.
20. CONTRACTOR SHALL TIE PIPING AND ELECTRICAL POWER BACK INTO RE-USED CONDENSING UNIT.

ALTERNATE PLAN NOTES

NOTE: ALTERNATE NOTES TO BE USED IF MORGUE TABLE/SINK ARE ACCEPTED.

21. DUCT SHALL BE 12x12.
22. DUCT SHALL BE 18x14.
23. EXHAUST VOLUME SHALL BE 1125 CFM.

NOTE:
SPRINKLER PIPING AND HEADS SHALL BE RE-ROUTED AS NECESSARY TO MEET REQUIREMENTS OF NFPA 15 AS WELL AS MISS NEW DUCTWORK AND EQUIPMENT. SYSTEM SHUT DOWN SHALL BE COORDINATED WITH OWNER 7 DAYS IN ADVANCE.

23 09 50 - 1
SECTION 23 09 50
SEQUENCE OF OPERATIONS FOR HVAC

PART 1 _ GENERAL
1.1 DESCRIPTION
A. TEMPERATURE CONTROL SYSTEM SHALL PROVIDE ALL CONTROL DEVICES, WIRING, PROGRAMMING, SENSORS, ETC. AS IS REQUIRED TO PROVIDE THE SEQUENCES AS DESCRIBED HEREIN. THE CONTRACTOR IS RESPONSIBLE TO VERIFY, COMMISSION, AND TEST THE PROGRAMMING LOGIC AND TUNE PID CONTROL LOOPS TO PROVIDE OPTIMUM LEVEL OF PERFORMANCE.

PART 2 - PRODUCTS (NOT APPLICABLE)
PART 3 - EXECUTION
3.1 ALARMS
A. MONITOR PRESSURE DROP OF HEPA FILTERS IN MORGUE SUITE AND GENERATE A MAINTENANCE ALARM WHEN FILTER INDICATES THAT IT IS IN NEED OF CHANGE. VERIFY CLEAN FILTER CONDITION AND FILTER MANUFACTURER LOADED FILTER CONDITION.
B. MONITOR DIFFERENTIAL PRESSURE BETWEEN MORGUE AND CORRIDOR SPACE OUTSIDE OF ENTRY INTO MORGUE WHEN EXHAUST FAN IS RUNNING. IF SPACE IS NOT UNDER NEGATIVE PRESSURE FOR A PERIOD LONGER THAN 30 SECONDS, GENERATE AN INFORMATIONAL ALARM TO THE OPERATOR WORKSTATION.

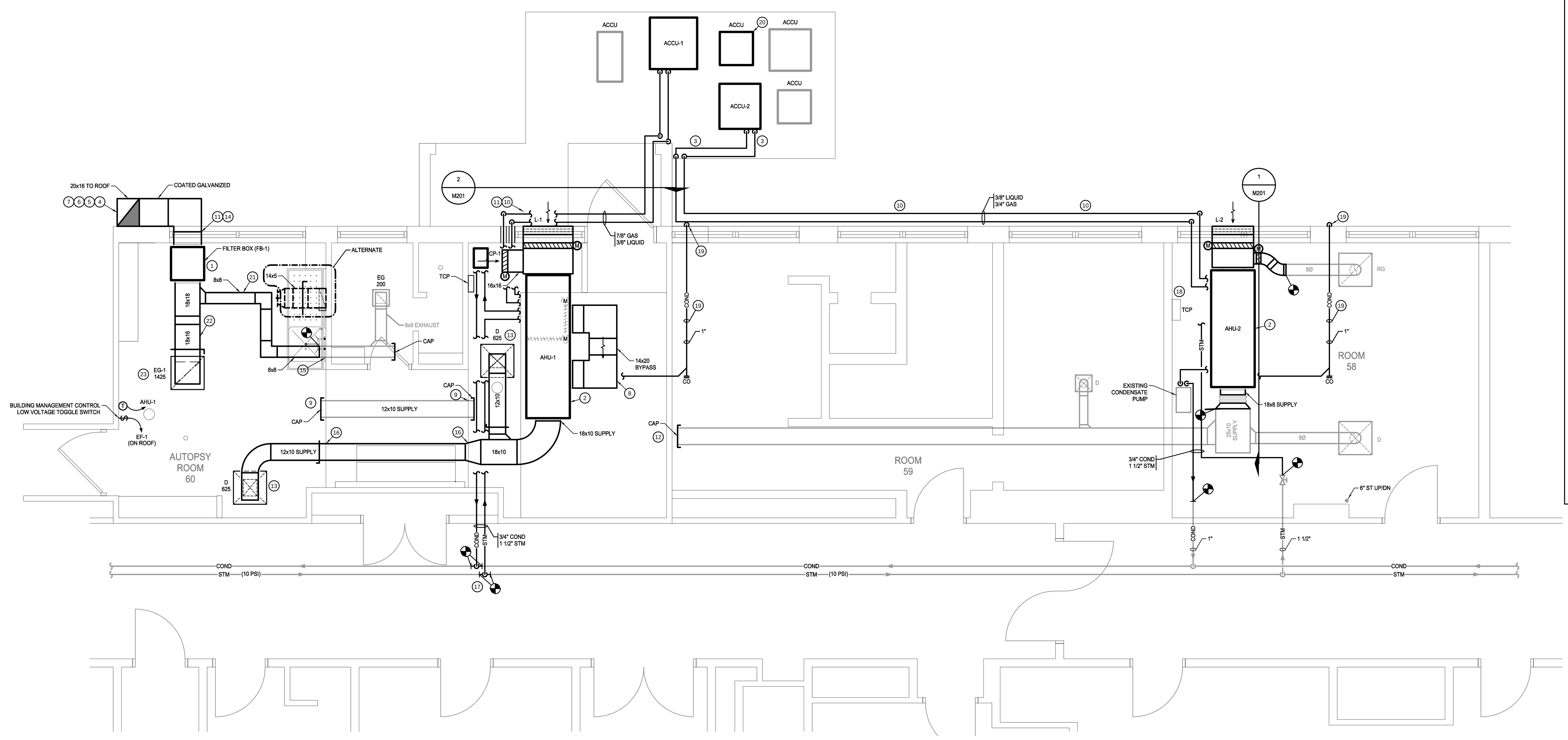
3.2 AIR HANDLER UNIT CONTROL SEQUENCES
A. SAFETY CONTROLS:
1. PROVIDE A LOW-LIMIT TEMPERATURE SENSOR WITH 20 FOOT ELEMENT SERPENTINE ACROSS THE LEAVING FACE OF THE HEATING COIL. SENSOR SHALL SHALL BE WIRED TO THE BUILDING CONTROLS INTERFACE AND NOT HARDWIRED INTO THE MOTOR CIRCUIT. IF THE LOW LIMIT FREEZE CONDITION IS DETECTED, MODULATE OUTSIDE AIR DAMPER CLOSED, RETURN AIR DAMPER OPEN, AND POSITION HEATING COIL FOR FULL FLOW. GENERATE AN ALARM CONDITION THAT CAN BE CLEARED VIA THE BUILDING CONTROL GRAPHIC WORKSTATION.
2. PROVIDE A HIGH LIMIT SUPPLY DUCT SENSOR TO PREVENT LEAVING AIR FROM RISING ABOVE 125 DEG F. SENSOR SHALL BE LOCATED IN THE SUPPLY DUCT IMMEDIATELY DOWNSTREAM OF AIR HANDLER.

B. AHU-1 (MORGUE CONSTANT VOLUME, HEATING, COOLING, MAKE-UP AIR)
1. UNOCCUPIED MODE:
a. OUTSIDE AIR DAMPER SHALL BE CLOSED AND RETURN AIR DAMPER SHALL BE OPEN. SUPPLY FAN SHALL CYCLE WITH STAGES OF DX COOLING AND STEAM HEAT AS REQUIRED TO MAINTAIN SETBACK TEMPERATURE SETPOINTS FOR THE SPACE.
b. IF COOLING IS REQUIRED AND OUTSIDE AIR TEMPERATURE IS LESS THAN SPACE, UTILIZE ECONOMIZER COOLING AS FIRST STAGE UNTIL THE OUTSIDE AIR TEMPERATURE RISES ABOVE RETURN AIR TEMPERATURE.
2. OCCUPIED MODE:
a. WHEN THE SPACE IS OCCUPIED, AS INDICATED BY THE TOUCH SCREEN EXHAUST FAN CONTROL DISPLAY IN THE SPACE, AIR HANDLER SHALL RUN INTERLOCKED WITH THE EXHAUST FAN.
b. SUPPLY FAN SHALL RUN AT CONSTANT SPEED.
c. OUTSIDE AIR DAMPER SHALL BE POSITIONED AT 100% OPEN AND PROVE OPEN VIA END SWITCH. IF DAMPER FAILS TO PROVE OPEN, GENERATE A CRITICAL ALARM TO THE BMS. RETURN AIR DAMPER SHALL CLOSE 100%.
d. IF OUTSIDE AIR TEMPERATURE IS ABOVE 35 DEG F, POSITION FACE AND BYPASS DAMPERS FOR FULL AIRFLOW TO THE COIL FACE AND CLOSE BYPASS.
1) MODULATE STEAM HEATING COIL VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT IN HEATING MODE.
2) STAGE DX COOLING CIRCUITS AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT IN COOLING MODE.
e. IF OUTSIDE AIR TEMPERATURE IS 35 DEG F OR LOWER, OPEN STEAM HEATING VALVE 100% AND MODULATE FACE AND BYPASS COIL DAMPERS TO MAINTAIN SPACE TEMPERATURE SETPOINT.
f. IF COOLING IS REQUIRED AND OUTSIDE AIR TEMPERATURE IS LESS THAN SPACE, UTILIZE ECONOMIZER COOLING AS FIRST STAGE UNTIL THE OUTSIDE AIR TEMPERATURE RISES ABOVE RETURN AIR TEMPERATURE.

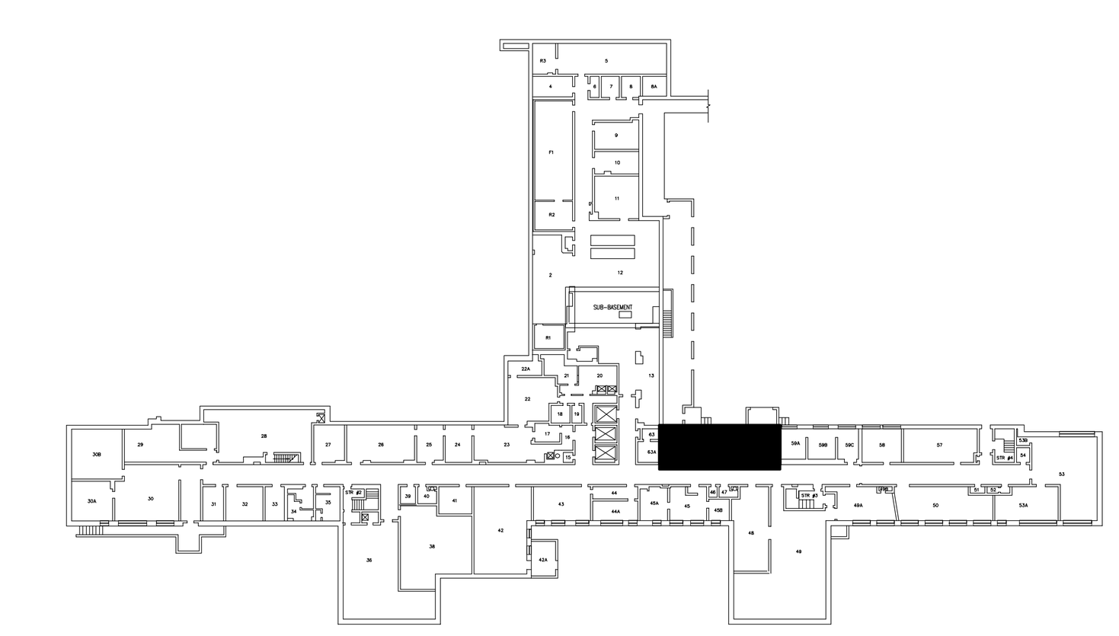
C. AHU-2 (LOCKER ROOM AND OFFICE CONSTANT VOLUME, HEATING, AND COOLING)
1. UNOCCUPIED MODE:
a. OUTSIDE AIR DAMPER SHALL BE CLOSED AND RETURN AIR DAMPER SHALL BE OPEN. SUPPLY FAN SHALL CYCLE WITH STAGES OF DX COOLING AND STEAM HEAT AS REQUIRED TO MAINTAIN SETBACK TEMPERATURE SETPOINTS FOR THE SPACE.
b. IF COOLING IS REQUIRED AND OUTSIDE AIR TEMPERATURE IS LESS THAN SPACE, UTILIZE ECONOMIZER COOLING AS FIRST STAGE UNTIL THE OUTSIDE AIR TEMPERATURE RISES ABOVE RETURN AIR TEMPERATURE.
2. OCCUPIED MODE:
a. SUPPLY FAN SHALL RUN AT CONSTANT SPEED.
b. OUTSIDE AIR DAMPER SHALL BE POSITIONED AT MINIMUM VENTILATION AIR WITH RETURN AIR DAMPER IN OPPOSITION.
c. MODULATE STEAM HEATING COIL VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT IN HEATING MODE.
d. STAGE DX COOLING CIRCUITS AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT IN COOLING MODE.
e. IF COOLING IS REQUIRED AND OUTSIDE AIR TEMPERATURE IS LESS THAN SPACE, UTILIZE ECONOMIZER COOLING AS FIRST STAGE UNTIL THE OUTSIDE AIR TEMPERATURE RISES ABOVE RETURN AIR TEMPERATURE.

D. EF-1 (MORGUE EXHAUST FAN, VARIABLE SPEED)
1. WHEN ACTIVATED VIA LOCAL ROOM CONTROL SWITCH, THE FAN SHALL BE STARTED TO A PREDETERMINED VALUE THAT MAINTAINS THE ROOM AT A NEGATIVE PRESSURE OF 0.05" W.C.
2. UPON ACTIVATION OF EXHAUST FAN, AHU-1 THAT SERVES THIS SPACE SHALL ALSO BE INTERLOCKED TO OPERATE WITH 100% OUTSIDE AIR WHILE EF-1 IS RUNNING.
3. THE BUILDING MANAGEMENT GRAPHICAL INTERFACE SHALL HAVE THE ABILITY TO ADJUST THE SPEED THROUGH THE FRONT END.
4. MONITOR THE VSD VIA BACNET INTERFACE AND ANNUNCIATE ALL ALARM CONDITIONS TO THE BMS OPERATOR WORKSTATION.
5. WHEN FILTER PRESSURE DROP RISES TO 2" OF WATER COLUMN, FILTER STATUS LIGHT (RED) SHALL BE ENERGIZED.
6. AFTER FILTER IS CHANGED AND FILTER PRESSURE DROP IS BELOW 2" OF WATER COLUMN, FILTER STATUS LIGHT SHALL BE MANUALLY RESET.

---- END ----



MECHANICAL PLAN
SCALE: 1/4=1'-0"



LOWER LEVEL KEY PLAN
NOT TO SCALE

Revisions:	Date

CONSULTANTS:

MICHAEL E. LUBBEHUSEN REGISTERED No. PE10302397 STATE OF INDIANA PROFESSIONAL ENGINEER

ARCHITECT/ENGINEERS:

PRIMARY ENGINEERING, INC.
Fort Wayne **Carmel**
2828 Lake Ave.
Fort Wayne, Indiana 46805
260.424.0444 ph 260.424.1444 fax
info@primary-eng.com www.primary-eng.com
PRIMARY ENGINEERING INC

PRIMARY JOB # 09252

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